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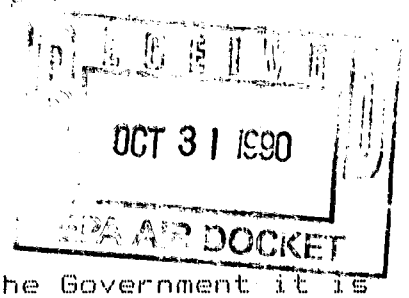
Casper College
125 College Drive
Casper, Wyoming 82601

October 11, 1990



William K. Reilly
Environmental Protection Agency
401 M Street, S.W.
Washington, D. C. 20460

Dear Mr. Reilly:

After reading the research performed by the Government it is difficult to understand why the E.P.A. would not support HiTec® 3000 fuel additive as an alternative to Ethanol gasoline blends.

You will find the literature supporting my conclusion, enclosed.

If you feel that this is not valid -- I would appreciate any information that is being withheld from the public that proves otherwise.

Sincerely,

Ed Boyer

Ed Boyer
Casper College

EB/bjs

DHV has beat a hasty, if only partial, retreat [illegible]

* * *

Superflop

On this page back in November 1979, we discussed the Danish government's disastrous experience with alternate energy sources, including a 200-ft, $700,000 windmill that managed to operate at 3/10 of 1% of design capacity in generating electricity. The Danes wisely junked the thing then and there. At the same time, we lamented that the same experience, at many times the cost, was in store for our own goofy alternate energy programs—which included a 200-ft windmill—implemented by DOE at the urging of then-president Carter.

We hate to say we told you so, but last month we finally got the word: the big windmill built by Nasa and DOE at a cost of $30 million, also in 1979, was pronounced a superflop—an operational and financial fiasco that was auctioned off for the handsome sum of $51,600.

The death of our big blooper brings several questions to mind, to wit:

- Why did it cost 42.85 times as much as Denmark's?
- Why did we duplicate a failure?
- Why did we fiddle with it for four years before killing it?
- Why was it put in a location where the wind was either too strong or too calm to run it, where people were kept awake at night by the noise, and where it played hob with TV reception?

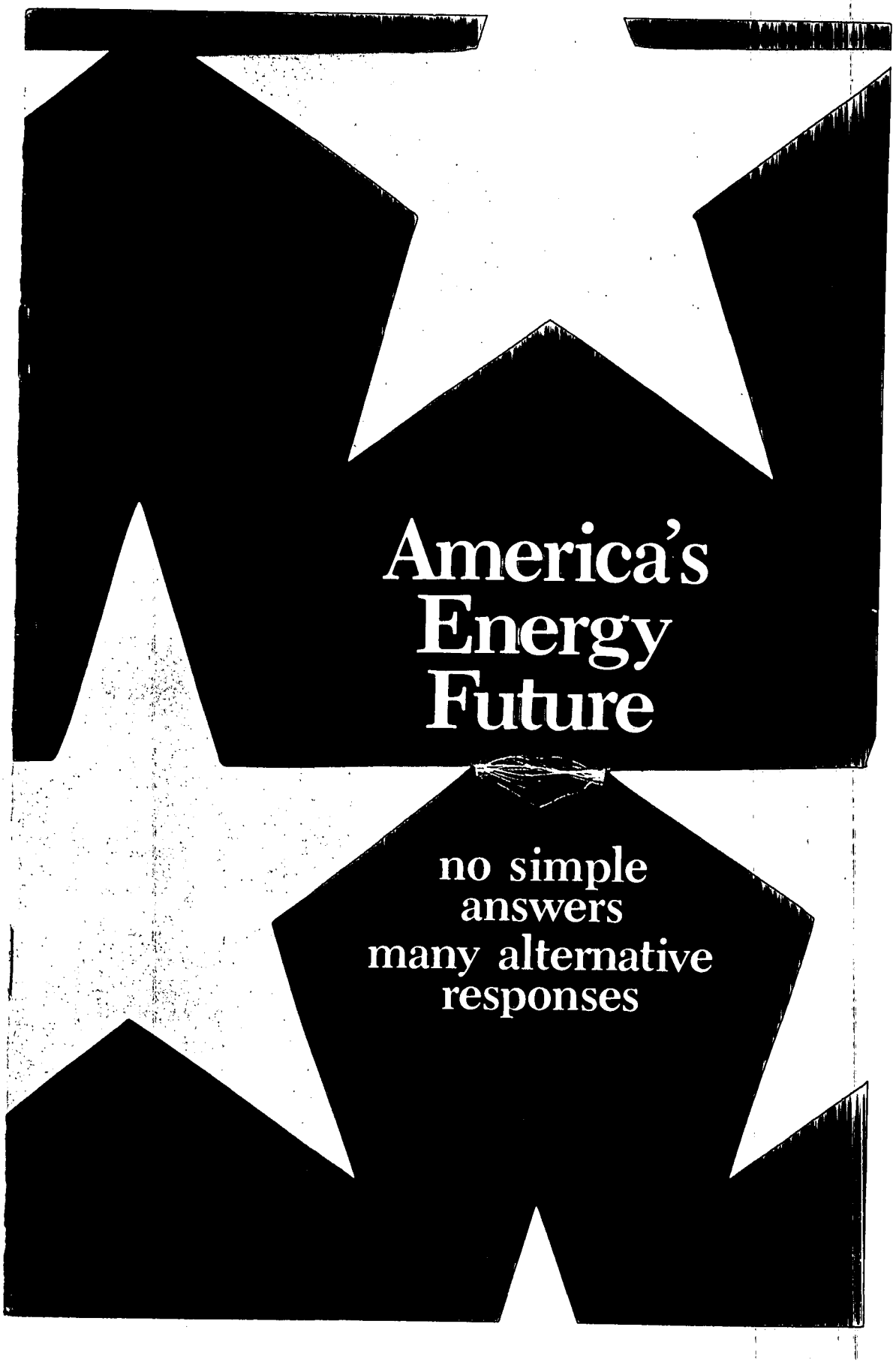
Although not a precise answer to the above, it is sufficient explanation that this superflop, financed by our tax dollars, was a government project administered by Nasa and DOE—two groups not exactly noted for thrift or horse sense—at the behest of those who would spend any amount of money on any energy project as long as it had nothing to do with oil or gas.

DOE's upcoming budget for R&D totals $3.3 billion. Hopefully, comparable idiotic exercises such as windmills will be excluded and we will be able to count ourselves extremely lucky we only lost a measly $29,984,400 on this one $30-million bad joke. However, we do have suggestions if the subject of big windmills ever comes up again. First of all, check with the Danes. Second, if we're still going to poop off money, DOE should contract with Sears for the equipment instead of Nasa—the former has a much longer and successful history in the windmill business, much better prices, and a vastly better feel for what's practical.

DOE IS Still Spending $ ON WIND Power?

Medicine Bow Wyo

Is the Pay back Equal to The Energy consumed To Produce The windmills? AND cost of Maintenance of Them.


America's
Energy
Future
no simple
answers
many alternative
responses

Note
pp 5&6

Remarks by JOHN C. MORLEY
Senior Vice President, Exxon Company, U.S.A.
to The Virginia Federation of Women's Clubs
April 9, 1980, Omni International Hotel, Norfolk, Virginia

I have been looking forward to this occasion, not only because I am privileged to address one of this country's foremost organizations — the Virginia Federation of Women's Clubs — but also because the task of participating in its 73rd convention presents a most interesting challenge. As I understand it, much of your agenda over the next two days deals with activities that bear on service to and development of human resources in the years ahead. This is a vital national need. And the task of meeting it is complex, difficult and often controversial. Yet your deliberations will and should proceed — with awareness that there are no simple answers, but rather, many alternative responses, which usually involve debate and compromise.

My subject today is similar. Our country's energy future is of vital national importance. It is complex, and controversial — fraught with issues that stir strong, emotional debate. Yet because it affects every one of us, we must all be involved. The issue is too important to be left just to government, or environmentalists, or lobbyists for any special interests, or, indeed, even the oil companies. So my message is straightforward and, of necessity, quite serious. I encourage each of you, and all the members of your clubs, to study the issues, to learn and to take an individual role in influencing our country's energy future.

For several years now, we have been witnessing the ending of an era of inexpensive, super-abundant energy. For many, this is hard to accept — almost as if an inalienable right was being taken away. People are angered and frustrated by tight energy supplies and higher prices. Some believe the whole problem has been caused by oil companies. Others blame government, foreign oil producing countries and even occasionally the consumer.

Unfortunately, this finger-pointing doesn't solve anything. As Will Rogers once put it, "The problem with letting off steam is that it clouds up the windows." It is encouraging to me that the leaders of Virginia women's clubs want to wipe some of the fog from the glass, and see the situation more clearly.

Today, we are going to look through that window to the 21st century and consider what needs to be done in development of this country's energy resources.

I'm going to share with you my company's assessment of the problem, and then discuss some potential parts of its solution. I don't intend to try to tell you what the exact ingredients of the solu-

tion should be. We have studied the problem far too long to think we have all the answers. Instead, I'll offer information that I hope will encourage you to look into the problem more deeply, make your own assessment of the alternatives, and take an active role in development of national energy policy. In the belief that you may be interested in some details that we won't have time to discuss, we have arranged for copies of an Exxon energy outlook brochure to be available to each of you. I suspect you may hear further reference to energy this evening as you consider "the critical issues of the '80s."

The Problem Defined

Let me start with a statement of the problem. Quite simply, the demand for energy in our country is greater than our ability to supply that demand from our own domestic energy resources.

Consumption of energy has been rising — as populations have grown and people have used energy to improve their standards of living. We obtain this energy, in a variety of forms, from a variety of sources.

One-fourth of our total energy comes from our fastest growing sources — nuclear power and coal. They provide energy in the form of electricity and — in the case of coal — as a boiler fuel used by industry. We also get a small portion of our electricity from hydroelectric and geothermal sources.

Another one-fourth of our energy comes from natural gas. Much of this gas is used — like coal and nuclear — as boiler fuel or to make electricity. Most of the rest is used for heating our homes, cooking, and hot water. And some is needed as a raw material for making products from petrochemicals such as plastics, fibers, and synthetic rubber.

So one-half of our energy, mostly in the form of electricity, comes from coal, nuclear fuels, and natural gas.

The other half of our energy comes from oil. It also is used as fuel for boilers and electric generators, for heating homes, and in petrochemicals. But the greater part of the oil we consume (more than a fourth of total energy) is used as liquid fuel for transportation including automobiles, buses, trucks, trains, airplanes, and ships.

In transportation, petrochemicals and certain other uses that require the energy source in liquid or gaseous form, there are no ready substitutes for oil and gas. Yet we have been consuming more oil and gas each year than we have been able to replace. Domestic production is falling. We now get nearly half the oil we need from a handful of foreign countries — an amazing statistic, and one that underscores the seriousness of the problem. In other words, imported oil supplies nearly one-quarter of our energy.

The failure to find enough oil to replace what is consumed is now a worldwide problem. Governments in oil-exporting countries are concerned and would like to conserve their reserves. And we are hearing that some countries are cutting back production.

Foreign oil exporting nations have also driven up oil prices — by over a hundred percent versus a year ago. And this trend is expected to continue — although not at such a high annual rate — as the producing countries seek to achieve real growth in income.

Efforts in the United States and many other countries to develop other sources are costly and, in many cases, require long lead times. The frontiers of oil and gas exploration are moving into deeper ocean waters and hostile environments like Arctic Alaska. Results of exploration over the past decade in some very promising areas — including the northeast Gulf of Mexico and off our Atlantic coast — have been disappointing. Even if major new discoveries are made in the next few years, it's unlikely that oil or gas production from these discoveries can be developed before the mid to late 1980s.

The Heart of The Problem

But we miss the heart of the problem if we see it only in terms of higher prices and shortages. The real significance of the trends I've been discussing is twofold:

First, they threaten our country's strength, our security and our self-determination in world affairs. Whether we like it or not, maintaining working relationships with the oil exporting countries will have to be a major consideration in foreign policy for years to come.

Second, these trends jeopardize the health of our economy. In the past, we achieved rapid economic growth by increasing our use of abundant, inexpensive energy. Without adequate energy supplies, economic growth will not occur.

Now I'm aware that some people contend that economic growth is unimportant, and that at times it may have been too rapid for our own good. Certainly, some slowing of growth need not be disastrous. But before we embrace the idea of zero economic growth, we ought to ask some serious questions:

With our population still growing and economic growth halted, what would happen to the standards of living we now enjoy?

I know that your organizations are looking into scholarships and other ways of expanding opportunities for young people. In an era of no growth, would our country's young people still be able to look to the future with confidence and optimism?

What would zero economic growth mean to the hopes of minorities and others trying to improve their standard of living?

Would there be enough wealth — after necessities of life were provided — to support the arts, music, environmental improvements, and the many other activities essential to a higher quality of life?

At least a few of us in this room will admit to being old enough to have values shaped by the Great Depression. It taught us that we can "make do" with much less than we enjoy today. We like to

talk about that experience; however, very few would like to repeat it.

Fortunately, there are opportunities to achieve an energy supply and demand balance that will allow growth in the economy to continue. Energy can be conserved and used more efficiently. Coal and nuclear power have potential for growth. Substantial reserves of oil and gas remain to be found. Liquid fuels and gases can be made from oil shale and coal. And ultimately we may be able to rely heavily on solar and other forms of energy that can't be depleted or used up.

Each of these opportunities has advantages and limitations. Each has its advocates and detractors. I'd like to discuss several of the opportunities today — to give you a feeling of what they may or may not offer us.

Energy Conservation

The first and most obvious response to rising cost and scarcity of anything is to use it more sparingly.

Energy conservation has been recognized almost unanimously as the fastest and least expensive way to reduce our need for foreign oil. And I am most pleased to acknowledge your organization's efforts to encourage energy conservation. It should be pointed out, however, that not all forms of conservation are equally appealing.

One form can be categorized as "doing without." Many of us are "doing without" the comfort we used to get from setting thermostats a few degrees warmer in winter and cooler in summer. Many are doing without smooth rides we once enjoyed in large, heavy automobiles, and without the time we thought we once saved by driving 70 miles an hour on the interstate highways.

"Doing without" is often a necessary, though not particularly pleasant, part of human existence. It's not all bad. And those of us who still like to impart wisdom gained during the Depression occasionally preach to the younger generation that walking occasionally or using a bicycle just might build character.

Another form of conservation might be described as "doing just as much, or more, with less." Many homeowners have found that insulation, weatherstripping and storm windows can cut heating fuel use without loss of comfort. And energy efficiency in industry has improved dramatically. At Exxon, improvements in our operations over the past seven years or so are saving the energy equivalent of one billion gallons of crude oil a year. That's enough energy to provide electricity for two out of three homes in Virginia.

The potential for such savings is not, however, unlimited. Back in 1973, it was easy to go through plants built when energy cost was insignificant and find opportunities for huge savings. But as these opportunities are used up, it becomes more difficult to cut energy use without also reducing the plant's output. This is true of a plant, and it's also true of the whole economy.

I think most of us can agree that, while some slowing of

growth may be tolerable, economic growth *is* desirable. Energy growth is needed to support economic growth. And as our opportunities to improve energy efficiency are utilized, it will become increasingly important to develop new supplies — especially in forms needed to offset the decline in oil and gas production. So conservation is an important response, but not the total answer.

Renewable Energy Sources

I suppose the most intriguing of all the potential new energy supplies are those "renewable" or nondepleting forms derived from the sun — directly, as heat and light, or indirectly, as in power from the wind or ocean waves.

Solar energy is very appealing. It's inexhaustible, environmentally acceptable, and — in a sense — free. At Exxon, we are enthusiastic about its future. One of our affiliates makes and sells solar space and water heating systems. Another provides photovoltaic cells that turn the sun's rays into electricity.

However, we believe that solar, as a major energy source, will be a long time in developing. For solar does have its problems and limitations.

Most new home builders and buyers, for example, still don't see solar space and water heating as economically attractive — despite substantial tax credits. Buyers are deterred by initial costs — perhaps $2,500 for water heating, or about $15,000 for both water and space heat — as well as the need for conventional heating units for backup use when the sun doesn't shine.

Even if economics could somehow be ignored and solar water and space heat systems could be installed in all new homes and commercial structures, starting today, these systems would supply only 2 percent of the country's total energy needs by the year 2000.

I know this is not a universally shared view. Two distinguished members of Harvard's faculty — Robert Stobaugh and Daniel Yergin — argued recently in a popular book, *The Energy Future,* that much more can be accomplished. But we believe that more time will be needed.

Widespread use of solar electricity is even farther away. If you're willing to pay for it in your home, perhaps you can get it. But the cost estimates range up to $3 per kilowatt hour of electricity. Virginia Electric Power Company (VEPCO) today will deliver that kilowatt hour here in the Tidewater area for a little over a nickel. We'll have to make some significant technological breakthroughs if solar is ever to become cost-competitive with conventional utilities as a source of electricity for general use.

Again, the issue is not so much whether there'll be a solar energy base in this country, but rather when and how extensively *it will* develop.

Another renewable energy source — now on the market here in Virginia — is ethyl alcohol, also called ethanol. Today's gasohol is

a mixture of one part ethanol with nine parts unleaded gasoline. The ethanol is normally made from grain or sugar — and it seems obvious that substituting alcohol for gasoline can reduce the need for oil imports. And it can.

But ethanol also has its problems. It is about twice as expensive to produce as gasoline — and also more costly than synthetic fuels that can be made from oil shale or coal. The higher costs are being covered by state and federal subsidies, which are eventually paid by you and me as taxpayers.

Another of ethanol's problems is that it takes energy, lots of energy — mostly from oil and gas — to grow, harvest, dry and transport the grain. Still more energy is consumed to process the grain into ethanol — more in fact than it yields as a fuel. In the plants in the United States today, almost all of this processing energy is provided by oil and gas. As much as two gallons of oil — or the equivalent in scarce natural gas — must be used to make one gallon of ethanol.

Despite this, there is a role for alcohol fuels in our energy mix. Longer-term, if coal or waste material is substituted for oil and gas to provide the processing energy, ethanol may help reduce our need for oil imports. But for now, it is having the opposite effect.

Another nondepleting potential energy source is nuclear fusion — which involves fusing atomic nuclei together, rather than splitting them as in today's nuclear fission power plants. Like today's nuclear power, fusion faces highly vocal opposition. And experts say it isn't likely to be tried in a commercial application until around the turn of the century.

So what have I said about nondepleting sources of energy? They are feasible and environmentally appealing. And in another 20 to 30 years they can start to play an important role in supplementing our energy supplies.

Coal and Nuclear Power

However, for growth in domestic energy supplies in the more immediate future, we must look to coal and nuclear power.

I know that for some people this is a problem. The environmental and safety issues associated with these energy sources are very much before us today.

Yet we cannot ignore, in a program to become more energy self-sufficient, our most abundant resources. The country's reserves of uranium will be adequate for the expected near-term growth. And the United States has been described as "the Saudi Arabia of Coal." U.S. proved recoverable coal reserves are equivalent to twice the energy in all the known oil reserves of the Middle East. I have heard the problem of developing our coal resources expressed this way: coal is a great energy resource *except* we can't mine it, move it, or burn it. I think I'll let you develop your own summary for nuclear. However, nuclear and coal can help reduce imports by replac-

ing petroleum as electric generating fuel. And coal also can be used instead of oil and gas in large industrial boilers. Nuclear and conventionally burned coal cannot help us, however, in those uses — primarily in transportation — that require energy in liquid or gaseous form.

Attempts to develop the electric automobile have been under way for years. And some progress has been made in developing batteries light enough and strong enough to operate cars at reasonable speeds over adequate distances before recharging. But electric cars are likely to be very small, and their range will be quite limited. Their widespread use still seems several decades away.

Without near-term substitutes in many uses, liquid fuels and gases must continue to meet a large part of energy needs. As we saw earlier, together oil and gas provide nearly three-quarters of our energy today. And Exxon projects that liquids and gas will still have to supply nearly 50%, or one-half, of our energy needs in the year 2000.

The most obvious way to try to meet this need without increasing imports is to step up exploration for oil and gas here in the United States, and apply all the technology we can to recover as much as possible from the fields we already have discovered. As you might expect, Exxon favors steps in that direction. Price decontrol will help. Higher prices will make formerly uneconomic reserves attractive to produce. Speedier leasing and permitting of offshore prospects also could help, as would the opening of public lands and offshore areas now off-limits for petroleum development. While I don't intend to go into it today, development of these resources and the others that I'll be discussing will cost enormous — in some cases almost staggering — amounts of money.

But, again, there are limitations to what we can achieve. Petroleum potential already has been more thoroughly explored in this country than any other. At Exxon, we believe new discoveries may halt the decline in natural gas production — at least for a few years — in the mid and late 1980s. We think it's likely that domestic oil production will decline at a slower rate and remain fairly constant during the 1990s.

However, we forecast that domestic oil and gas production (which today meets almost half of U.S. energy demand) will be able to meet less than one-fourth of U.S. demand in the year 2000.

So where does that leave us? What can we do to bridge the gap created by declining petroleum production over the next 30 years or so before renewable, nondepleting energy sources begin to make a significant contribution to our energy needs? Currently the gap is being filled by petroleum imports.

Synthetic Fuels

We believe that the country can start reducing oil imports, while at the same time *increasing* its supplies of liquid fuels and gas, if we

move rapidly to develop an industry that can make such fuels from the country's abundant reserves of coal and oil shale.

Two such synthetic fuels appear to be economically competitive with oil at today's world price.

One is shale oil. It is obtained from a rock — oil shale — which is recovered by mining; it is then crushed, dried, and cooked in large retorts or ovens to yield a substance resembling a heavy crude oil. After processing to remove impurities and lighten the oil, it can be refined to produce gasoline, heating oil, jet fuel, fuel oil and other products.

The other synthetic fuel now cost-competitive is a gas made from coal. It's called "intermediate heat or BTU gas" because its burning produces only about 40% as much heat as natural gas. It's suitable for use as boiler fuel by industry or as a raw material in petrochemicals manufacture.

As world oil prices continue to increase, it also will become feasible to convert coal into a gas that can be mixed and used with natural gas, and even convert coal into a variety of liquid fuels. This process is called coal liquefaction.

Much of the manufacturing and processing know-how for synthetic fuels production already has been developed. And if construction of the first plants starts soon they can begin easing our supply situation and allowing us to reduce oil imports by 1990.

But, as with the other potential sources of energy, there are problems to be overcome. Synthetic fuels development will be expensive. And the task of building a large industry, from scratch, within 10 years or so will depend very heavily on whether our country can develop a strong sense of national determination — not only to maintain incentives to fund the project — but also to deal with the environmental issues.

Large surface mines will be involved, and high standards for reclamation and revegetation of mined-over areas will have to be established and met. Care will have to be taken to contain waste materials and prevent runoff into streams or rivers. Emissions into the atmosphere will have to be properly controlled. And issues involving acid rain caused by excessive sulfur and nitrous oxide buildup — or excess carbon dioxide accumulation creating a possible warming of the atmosphere — must be faced and dealt with.

Another concern is the supply of water for processing. It takes two to three and one-half barrels of water to make one barrel of synthetic fuels. And water is scarce in some of the Western areas where the industry will have to be concentrated. It will take a high degree of cooperation — involving both business, government at federal, state and local levels, and other interests — to arrange for necessary water supplies.

Cooperation also will be needed to provide housing, schools and other necessities for workers who will be moving in large numbers into areas where today there are very few people.

Conclusion

As promised, I will leave you to consider your own opinions as to what forms of energy conservation and development you favor.

For what it's worth, my own view is that individually none of the solutions I've discussed alone can do the job. But each one *can* make a contribution. And, together, they can assure an energy supply adequate to keep our economy reasonably healthy while we gradually make an inevitable energy transition. This transition will take us from today's heavy dependence on petroleum, to a more diversified mix of supply, and eventually to energy supplies that can't be depleted. This country has made two previous energy transitions — one from wood to coal; the other from coal to petroleum and natural gas — each taking about fifty years.

I recognize that other scenarios can be written.

Some say it's already too late — that severe interruption of oil imports is likely to leave our country with a greatly weakened economy, inability to defend itself, and possible vulnerability to foreign military adventure.

Others say we'll "luck out" — that some breathtaking technological breakthrough will make more difficult forms of conservation and development unnecessary.

Both these scenarios strike me as unlikely, and I think we will wind up somewhere between them.

We'll have to make some major adjustments. More of us may have to live, for example, in multiple-unit housing. We may rely more on mass transit. We will think twice about choosing to live some 20 or 30 miles away from work. We will still use automobiles, but they'll be smaller. Exxon estimates that the *average* new car made in the year 2000 will weigh only as much as a Honda Civic, which, as you may know, is one of the tiniest cars on the road today.

For some, such changes may involve some inconvenience. But I don't believe they are intolerable. More drastic changes, and serious economic deprivation, don't have to occur — if we will aggressively seize the opportunities we have to conserve energy, develop all feasible forms of energy supply and begin to reduce our dependence on imported oil.

However, we have to get going.

Americans have been aware of their energy problem at least since the Arab oil embargo in the fall of 1973. And our progress toward solving it has been less than satisfactory. We are far more dependent on insecure foreign oil supplies today than ever before.

As I suggested earlier, the stakes involved are too high to leave the solution of the energy problem to others. I encourage you to become informed, to take a position and to play an active role on behalf of policies that will allow our country to use the resources it has to solve the problem. With your participation in this manner, I am confident more fog will be removed from the glass.

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100M880

Darren Brookes
5/21/90

The 1990 Clean Air bill to be debated this week in the House of Representatives has almost nothing to do with clean air and nearly everything to do with special interests using government to take "rents" from the public they could not otherwise earn.

There is no better example than the alternative fuels amendment to the Senate version of the Clean Air bill. It in effect mandates that as many as 53 major cities which exceed surface ozone (smog) or carbon monoxide limits start using "gasohol" or some other blend of gasoline and ethanol, a heavily subsidized corn-based alcohol. Over 70 percent of ethanol is produced by the politically connected Archer Daniels Midland Corp. (ADM).

But a new study by the respected Sierra Research, of Sacramento, Calif. (the firm is a consultant to the Environmental Protection Agency and the California Air Resources Board), shows that while ethanol-gasoline blends do reduce carbon monoxide by 25 percent, they increase nitrous-oxide emissions by 8 percent to 15 percent and evaporated hydrocarbons by 50 percent. (See table)

Since nitrous-oxide emissions are even more active precursors of ozone, and total hydrocarbon emissions rise, the net effect of ethanol blends is to *increase* surface ozone by about 5 percent. Sierra concludes. In combination with the well-established cost-penalty and fuel-economy loss caused by ethanol-gasoline blends, motorists would end up paying more for dirtier air.

Sen. Daniel Patrick Moynihan, New York Democrat, said at a hearing, "It seems we are going to begin to pay a high price for smog that we now get for free." He sarcastically added, "If the Congress is going to legislate the use of a product which increases pollution, it should at least be done in a separate piece of legislation from the Clean Air Act."

Alternative fuels promoters immediately attacked the ethanol study not on its research merits, but because it was financed by the American Petroleum Institute. However, the results are absolutely no surprise to the EPA.

In 1978, the EPA's Richard Lawrence evaluated gasohol and found that the use of ethanol so increased gasoline evaporative emissions, it could *not* qualify under the 1977 Clean Air Act. Unfortunately, then EPA Administrator Doug Costle sat on that report long enough to allow gasohol to become legal without EPA permission. In 1987, another request for formal EPA ethanol approval was denied on similar grounds.

By that time, however, ethanol had become such a major subsidized enterprise both for Corn Belt farmers and Archer Daniels Midland Corp., it enjoyed impregnable political support. The New York Times, in an April 1 expose of the "The High Oc-

There is a sludge by-Product From Ethanol manufacturing AND This is not mentioned IN Research. This has to be Transported From the site. It can be used For cattle Feed but Spoils within Two day. So there is a Disposal Problam. Their is Two Solutions, one have a big cattle Feed lot at the Distillery Two A cattle Train to Transport them to breakfast and then return Them to the Field Till there next Feeding.

over

tane Ethanol Lobby," says since 1979 ethanol has received $4.6 billion in tax subsidies alone.

"It also showed that when it comes to political clout in Washington, Archer Daniels Midland Chief Executive Dwayne Andreas makes financier Charlie Keating look like a corner caterer. Mr. Andreas has close alliances with two of Washington's top movers and shakers, Senate Minority Leader Robert Dole and former Democratic Party Chairman and U.S. Trade Representative Robert Strauss who has been on the ADM board of directors and a member of its executive committee.

It was Mr. Dole who engineered the first tax break for ethanol in 1978 and, according to the Times, has "since sponsored about a dozen other bills designed to promote and protect ethanol."

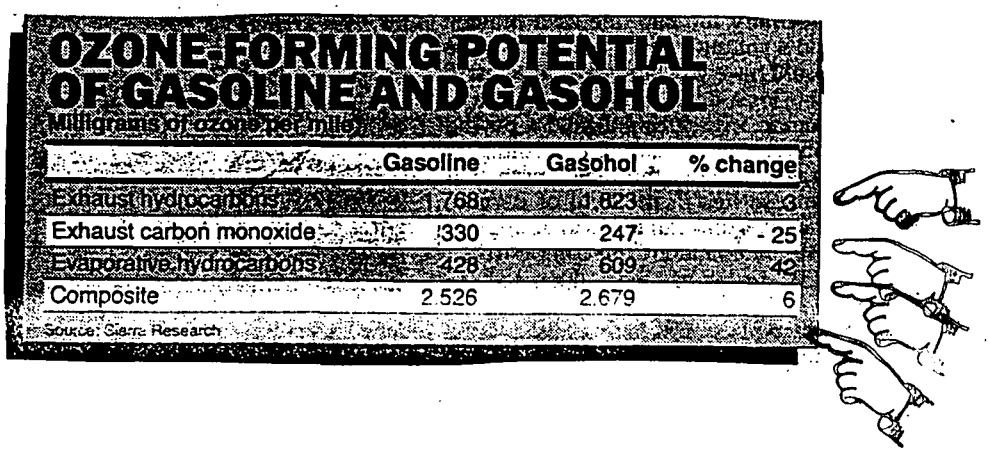
"Meanwhile ADM's political action committee, along with Andreas and his relatives, were contributing tens of thousands of dollars to Dole campaigns. The company's private plane has flown Dole to Midwest speaking engagements, and for a time ADM sponsored Dole's commentaries over the Mutual Radio Network. The senator and his wife, Elizabeth Dole, currently secretary of Labor, purchased an apartment from Andreas in 1982. They paid $150,000 — less than the market value."

But Mr. Andreas' clout extends far beyond these two prominent leaders with tens of thousands in campaign contributions to both sides of the political aisle. ADM also is a major sponsor of the Sunday morning television talk shows with commercials which routinely tout the smog-fighting advantages of ethanol.

What those commercials don't mention is ethanol blends are exempt from about 22 cents in federal and state taxes and use 2.4 bushels of corn to produce each gallon of ethanol. Corn subsidies have been running from 25 cents to $1 per bushel. That means up to $1 per gallon in subsidies for dirtier air.

This week, House greenie Democrats led by Rep. Henry Waxman of California will try to defuse the ethanol bandwagon with an even worse proposal to mandate that by 1995 the auto industry produce and sell 500,000 cars capable of using methanol, wood alcohol.

Yet another recent Sierra Research study on methanol — done on its own for no industry client — shows that "ozone production due to exhaust emissions from the methanol vehicle would be the same or higher than that due to emissions from the gasoline vehicle," while costing motorists from 15 cents to 30 cents more per mileage gallon.



Method Outshines Data In Global Warming Study

A recent study of atmospheric temperatures over the past decade failed to find evidence of global warming, at least in the short term, but scientists say the methodology holds promise for making long term conclusions.

Global warming and the "greenhouse effect" moved into the spotlight during the brutally hot summers in the latter part of the 1980s. Some experts claim that the earth is heating up as a result of carbon dioxide and other gases that have been released into the atmosphere since the dawning of the industrial age.

Ten years of satellite observations of the earth have revealed no evidence of a warming trend during the 1980s. Scientist add, however, that it will take at least another decade of measurements to draw a firm conclusion.

The most important finding, according to Dr. Roy Spencer, space scientist at the Marshall Space Flight Center in Huntsville, Ala., is that "the data could be used to monitor quite precisely variations in atmospheric temperature on a weekly or monthly or yearly time scale." So while the recent findings are not conclusive, studies done by satellite may eventually provide a definitive answer to the question of global warming.

The current data was collected between 1979 and 1988 by the TIROS-N series of weather satellites, according to a paper prepared by Spencer and co-investigator John R. Christy of the University of Alabama at Huntsville for the journal Science.

"The time series for the first 10 years . . . showed a lot of variability from month to month and year to year, but there was no long term trend during that 10 year period of time," Spencer explains.

On a global basis, the study found that the warmest years, in descending order were 1987, 1988 and 1983 (a tie) and 1980. The coolest year was 1984, followed by 1985 and 1986.

And just what does all this mean?

"From a climate point of view, it probably doesn't mean very much," Spencer admitted. "It's only 10 years. It does mean that we can go 10 years and maybe not expect to see global warming." He adds that the findings refute the popular perception among people that the earth's atmosphere is gradually warming up year by year.

Peter Rogers, the Gordon McKay professor of environmental engineering at Harvard University agrees that, beyond contradicting assertions that the earth's atmosphere is warming on an annual basis, the study's findings "don't prove anything."

Yet Rogers is enthusiastic about the study, saying the effort should be "greatly applauded," and that "scientists should provide much intellectual and emotional support.

"That the climate is going to change is no surprise," Rogers notes. "History shows that temperatures have been higher and lower and that places have been wetter and drier than they are now." However, Roger says that this kind of research measurement will provide important insight into the question of global warming.

"It puts the general circulation model in context," he adds, noting that "we sometimes believe more in our models than actual scientific data."

In response to the argument that the data is from too short a period of time to be meaningful, Spencer points out that during the same time period, thermometer data showed that there was a small "but statistically significant warming." He is still attempting to discover the root of the disagreement, but notes that temperature readings from ground-based thermometers do not fully reflect the global temperature as very few measurements are available for the large area of the earth's oceans.

The satellite readings will increase in significance as data from this decade starts to roll in. "If the temperature were to gradually rise for the next five or six years, let's say, I think that would be very significant," Spencer says. "If the temperature does the same thing in the next decade as it did in the first decade, in other words, if the satellites show that still there is no warming, then I think people would start to seriously doubt whether indeed we'll ever have any greenhouse or global warming in the future."